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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/096,593	06/12/1998	STEPHEN D. O'CONNOR	67456-5006US	1989

67374 7590 12/10/2007

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EXAMINER	
COOK, LISA V	
ART UNIT	**PAPER NUMBER**
1641	
MAIL DATE	**DELIVERY MODE**
12/10/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	09/096,593	O'CONNOR ET AL.	
	Examiner	Art Unit	
	Lisa V. Cook	1641	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *18 September 2007*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *20,22,23 and 30-39* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *20,22,23 and 30-39* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/22/07*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's response to the Office Action mailed 4/18/07 is acknowledged (paper filed 9/18/07. Claims 1-19, 21, and 24-29 have been previously canceled. Accordingly, claims 20, 22, 23 and 30-39 are pending and under consideration.

2. Rejections of record not reiterated herein have been withdrawn.

OBJECTIONS WITHDRAWN

Information Disclosure Statement

3. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the examiner on form PTO-892 or applicant on PTO-1449 has cited the references they have not been considered.

4. The IDS filed June 24, 2005 has been considered as to the merits.

5. The IDS filed December 27, 2005 has been considered as to the merits.

6. The IDS filed September 13, 2006 has been considered as to the merits.

7. The IDS filed October 22, 2007 has been considered as to the merits.

REJECTIONS WITHDRAWN

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

8. Claims 20, 22-23 and 30-39 are withdrawn from rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter, which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The claims have been modified to read on a passivation monolayer comprising two covalently attached passivation species and a protein binding ligand. However, Applicant has not cited support for the new claim limitation and examiner was unable to find support. Therein the limitation is considered new matter. Applicant is invited to show support for this limitation.

Response to Arguments

Applicant has shown support for the claim language. In particular, the recitation of a passivation monolayer comprising two covalently attached passivation species and a protein binding ligand (see pages 5 and 6 pf the response filed 9/18/07). Accordingly, the new matter rejection is withdrawn.

REJECTIONS MAINTAINED

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

I. Claims 20, 30, 34, and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hollis et al. (WO 93/22678) in view of Agladze (Metallurgy and Foundry Engineering, 1997, 23(2), 127-137) abstract and full document.

Hollis et al. disclose an apparatus (sensor array) meeting the instantly claimed limitation. The apparatus includes a test chamber with an array of first measuring electrodes (test sites), a passivation agent monolayer, a binding ligand covalently attached to the electrode via a spacer, a voltage source and an electronic detector.

See abstract, figure 26 A and page 24 lines 5-25 for spacer definition. Ligands useful in this apparatus include proteins (peptides). See page 1 lines 10-13. The test sites are monolithic structures on semiconductor chips or wafers (test chambers).

Binding of the test sites is measured by two electrodes at each test site. See page 4 lines 5-9 and line 16. The test site may be employed to identify target molecules such as polynucleotides, DNA, RNA, cells, antibodies, or anti-antibodies. See page 8 lines 20-22. Two electrodes at each test site measure the binding of the target to the test site. See page 4 lines 5-9 and line 16.

The test site also includes upper and lower electrodes covered with a film and measures voltages in relationship to target molecule binding, hybridization, or interaction. See page 11 lines 14-32. The sensor array contains binding ligands (such as short oligonucleotide strands) attached to the test site. See page 13 lines 11-21.

The arrays are not limited to only oligonucleotide reagents but can be other ligands to make different probes. The probes can be attached directly to the electrodes or solid support substrates (spacer) via covalent linkage. See page 24 lines 5-25.

In one embodiment, the sensor array probes include a aestivating layer (passivation agent monolayer). See figure 26 and page 29 line 27-30. The sensors can be evaluated with a microfludic detector. See page 34-35, for example.

The passivation layer is taught to be useful in increasing the life of the electrode. See page 44 lines 6-9.

Hollis et al. differ from the instant invention in not specifically teaching that the passivation layer (passivation agent monolayer) comprises two passivation species.

However, Agladze discloses that passivation films (layers) can modified electrode reactivity reactions via OH ions (species one) and anions (species two). See abstract.

Accordingly it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the OH ions (species one) and anions (species two) taught by Agladze et al. into the passivation layer apparatus/device of Hollis et al. in order to modify electrode reactivity reactions. See abstract of Agladze. One of skill in the art would have been motivated to modify the electrode reactivity to determine the optimal electrode reaction parameters.

II. Claims 31-33 and 37-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hollis et al. (WO 93/22678) in view of Agladze (Metallurgy and Foundry Engineering, 1997, 23(2), 127-137) abstract and full document, as applied to claims 20, 30, 34, and 36 above, and further in view of Kossovsky et al. (U.S.Patent#5,585,646).

Please see Hollis et al. (WO 93/22678) in view of Agladze (Metallurgy and Foundry Engineering, 1997, 23(2), 127-137) as set forth above.

Hollis et al. (WO 93/22678) differ from the instant invention in failing to specifically teaching passivation agent monolayer or self-assembled monolayer devices/apparatus including insulators and/or conductive oligomers.

However, Kossovsky et al. disclose improved bioelectronics devices in comprising a layer of a polyhydroxy oligomer that is spaced between the surface of a semi conductive material (applicants monolayer) and a electronically active biochemical molecule (applicants binding ligand) which is bound to the semi conductive surface of an electronic device (applicants electrode). The layer of polyhydroxy oligomer functions as a biochemical stabilization layer to prevent denaturization of the electronically active biochemical molecule (Abstract).
The stabilization layer is made up of one or more polyhydroxy oligomers. Exemplary polyhydroxy oligomers include carbohydrates, carbohydrate derivatives, and other macromolecules with carbohydrate like components. Kossovsky et al. further teach that the surface modification concept and the electron donor-acceptor concept can be combined at the semiconductor surface and utilized in various methods.

Hollis et al. (WO 93/22678) in view of Agladze (Metallurgy and Foundry Engineering, 1997, 23(2), 127-137) and further in view Kossovsky et al. (U.S.Patent#5,585,646) are analogous art because they are from the same field of endeavor, all the inventions teach the fabrication/utility of electrochemical
biosensors.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the insulators and/or conductive oligomers taught by Kossovsky et al. in the apparatus/device of Hollis et al. to perform analyte detection in an affinity assay system because Kayyem et al. taught that insulators serve to inhibit or slow electron transfer (column 24 lines 25-27) and conductive oligomers increase the rate of electron transfer and are more conductive than the insulators (column 6 lines 25-47).

Further, Kossovsky et al. disclosed that the use of self-assembled monolayer (reading on passivation agents or a type of SAM) allows the molecules to be held in a specific orientation with respect to the metal and are applicable in many system designs (Column 4, Lines 12-25).

> recent advances have extended self-assembled monolayer beyond the prototype gold/thiol systems. Fatty acids on aluminum, silanes on silicon, isonitriles on platinum and rigid phosphates on metals are all examples.

Kossovsky et al. also teach the use of the any denaturization of the biochemical material which might be caused by the semiconductor material is eliminated or substantially reduced by placing the stabilization layer of polyhydroxy oligomers between the biochemical material and the semiconductor (Column 7, Lines 13-18).

One of ordinary skill would have been motivated to employ insulators and or conductors (oligomer) to control electron transfer in binding systems like the one of Hollis et al. to ensure optimal working ranges for precise and accurate evaluation of an analyte of interest.

III. Claim 35 is rejected under 35 U.S.C.103(a) as being unpatentable over Hollis et al. (WO93/22678) in view of Agladze (Metallurgy and Foundry Engineering, 1997, 23(2), 127-137) abstract and full document, and further in view of Wohlstadter et al. (U.S.Patent#6,090,545).

Please see Hollis et al. (WO 93/22678) in view of Agladze (Metallurgy and Foundry Engineering, 1997, 23(2), 127-137) as set forth above.

Hollis et al. (WO 93/22678) in view of Agladze (Metallurgy and Foundry Engineering, 1997, 23(2), 127-137) differ from the instant invention in failing to specifically teach a processor for data analysis in their device designs.

However, Wohlstadter et al. disclose patterned, multi-array multi-species surfaces on a support (PMAMS) that are electronically excited in electrochemiluminescence (ECL) based tests. The PMAMS can be generated from self- assembled monolayer on a surface. (column 13, lines 10-31). In figure 47 shows an embodiment in which the multi-array apparatus/device includes a microprocessor/computer containing controller means for generating and analyzing ECL signals. See column 7 lines 38-40. The apparatus further provides a voltage source and photon detector. Column 3 lines 59-65 and column 22 Voltage Waveform.

Hollis et al. (WO 93/22678) in view of Agladze and Wohlstadter et al. (U.S. Patent #6,090,545) are analogous art because they are from the same field of endeavor, because the inventions teach the fabrication/utility of electrochemical biosensors.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use a processor/computer to analyze the generated device signals as taught by Wohlstadter et al. in the apparatus/device of Hollis et al. (WO 93/22678) in view of Agladze to perform analyte detection because Wohlstadter et al. indicate that "computer controlled voltage systems" are advantageous.

Specifically the computer/processor can be used to select a particular electrical potential or a particular range of electrical potentials over a predetermined time. Column 24 line 63 to column 25 line 5.

One of ordinary skill would have been motivated to do this in order to control the device reaction parameters and produce accurate/reproducibly data analyses in rapid time.

Response to Arguments

10. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Applicant argues that Hollis does not teach or suggest "a passivation agent monolayer" and while Hollis does exemplify passivation layers the net effect of ablation is the elimination of the passivation layer at the point of ligand attachment and this is opposite the configuration of the instant claims.

This argument was carefully considered but not found persuasive because the instant claims are directed to the apparatus. The use of the apparatus or net effect (outcome of the method) is not given patentable weight. It has been held that a recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from the prior art apparatus satisfying the claimed structural limitations. Ex parte Masham, 2 USPQ2d 1647 (1987).

Further, Applicant has acknowledged that Hollis describes a passivation layer on the electrodes at page 44 (see page 7 of the response filed 2/12/07). Accordingly the rejection is maintained.

In response to applicant's argument that the reference of Hollis fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., film on the electrodes) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant contends that Hollis forms a passivation layer on to a CCD device and not measuring electrodes as the instant invention. This argument was carefully considered but not found persuasive because Hollis discloses that CCD devices (arrays) comprise electrodes. See page 4 line 29, for example.

In response to applicant's argument that the reference of Hollis fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., protection layer of amorphous materials) are not recited in the rejected claim(s).

Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant further contends that a "layer" is not a "monolayer". And while a "layer" is a genus, and "monolayer" is a species. A species does not always anticipate a claim within a genus. This argument has been carefully considered but not found persuasive because the claims were not rejected as anticipatory but under obviousness. The test for obviousness is not whether the features of one reference may be bodily incorporated into the other to produce the claimed subject matter but simply what the combination of references makes obvious to one of ordinary skill in the pertinent art. See In re Bent, 52 CCPA 850, 144 USPQ 28 (1964), In re Nievelt, 179 USPQ 224 (CCPA 1973).

Applicant also argues that Hollis et al, do not teach monolayers. This argument was carefully considered but not found persuasive because Hollis teaches electrode coating procedures to form passivation layers and such coatings read on monolayer preparations. Absent evidence to the contrary the configuration of layer is obvious and taught by the cited prior art.

Applicant contends that Agladze is not analogous art because the reference discusses studies in the filed of metal corrosion (protection of the electrode). This argument was carefully considered but not found persuasive because all the cited references and the instant claims are drawn to electrodes. The protection of the electrodes (from corrosion) is deemed pertinent to the instant invention because corrosion could destroy the electrodes. Thus the matter with which the cited art deals, logically would have commended itself to the instant invention. In re ICON Health and Fitness Inc., 83 USPQ2d 1746 (Fed. Cir. 2007).

Applicant argues that the reference to Agladze does not teach OH ions and anions formation of a monolayer as taught in the instant application. This argument was carefully considered but not found persuasive because the features upon which applicant relies (i.e., monolayer distinction as taught in the specification) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Applicant contends that Hollis et al. in view of Agladze et al. do not teach the instant invention because the combination does not teach covalent attachment, and "adsorbed" is not "covalent". This argument was carefully considered but not found persuasive because Hollis et al. teach covalent attachment of reagents to electrodes. See page 24 lines 22-25 for example. While Agladze et al. disclose electrode coating with a passivation agent via adsorption or hydrogen-bonding mechanisms (reading on covalent interactions). See page 132 section 3, for example. The prior art has shown that "adsorption" can produce covalent bounded passivation monolayers. This position is supported by the following abstracts: Kaxiras, Materials Research Society Symposium Proceedings, 1990, 193 (At. Scale Calc. Structure. Mater.), 143-148 and Ohno, Surface Science, 1991, 255(3), 229-236.

Applicant also contends that the combination of Hollis in view of Agladze does not teach a second passivation species comprising a protein binding ligand. This argument was carefully considered but not found persuasive because Hollis teaches applications involving protein ligands. See page 1. Hollis also describes devices bounded with various ligands to detect an analyte of interest. See pages 40-42 and Table III.

In response to applicant's argument that Kossovsky, and Wohlstadter are nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, all the cited art teach electrode devices having coated materials thereon. The rejections are maintained.

Applicant argues that there is no specific suggestion or teaching in the refernces to combine the prior art. This argument was carefully considered but not found persuasive because KSR forecloses the argument that a specific teaching, suggestion, or motivation is required to support a finding of obviousness. See recent Board decision Ex parte Smith, --USPQ2d--, slip op. at 20, (Bd. Pat. App. & Interf. June 25, 2007) (citing KSr, 82 USPQ2d at 1396).

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

In this case, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the OH ions (species one) and anions (species two) taught by Agladze et al. into the passivation layer apparatus/device of Hollis et al. in order to modify electrode reactivity reactions. See abstract of Agladze. Agladze also teaches that the modification of the electrode to prevent the possibility of electrode inhibition. See page 132 section 3. One of skill in the art would have been motivated to modify the electrode reactivity to determine the optimal electrode reaction parameters.

Allowable Subject Matter

11. Claims 22 and 23 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. For reasons aforementioned, no claims are allowed.

13. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

14. Papers related to this application may be submitted to Group 1600 by facsimile transmission. Papers should be faxed to Group 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform to the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The Group 1641 – Central Fax number is (571) 273-8300, which is able to receive transmissions 24 hours/day, 7 days/week. In the event Applicant would like to fax an unofficial communication, the Examiner should be contacted for the appropriate Right Fax number.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lisa V. Cook whose telephone number is (571) 272-0816. The examiner can normally be reached on Monday - Friday from 7:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Long Le, can be reached on (571) 272-0823.

Any inquiry of a general nature or relating to the status of this application should be directed to Group TC 1600 whose telephone number is (571) 272-1600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see httpr//pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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